

The Ottawa Internet Exchange

Motivations and Benefits of Connecting

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Agenda

- OttIX presentation
- TorIX experience
- Jim Yuan's Phase II fiber build.

What is an Internet Exchange?

- An Internet Exchange can also be called an “Exchange Point”
- It’s a neutral, common meeting place for a community of organizations to connect to and exchange community traffic quickly and cheaply
- The meaning of community varies
 - A city having many ISPs
 - A group of companies having a common business theme

How is it done?

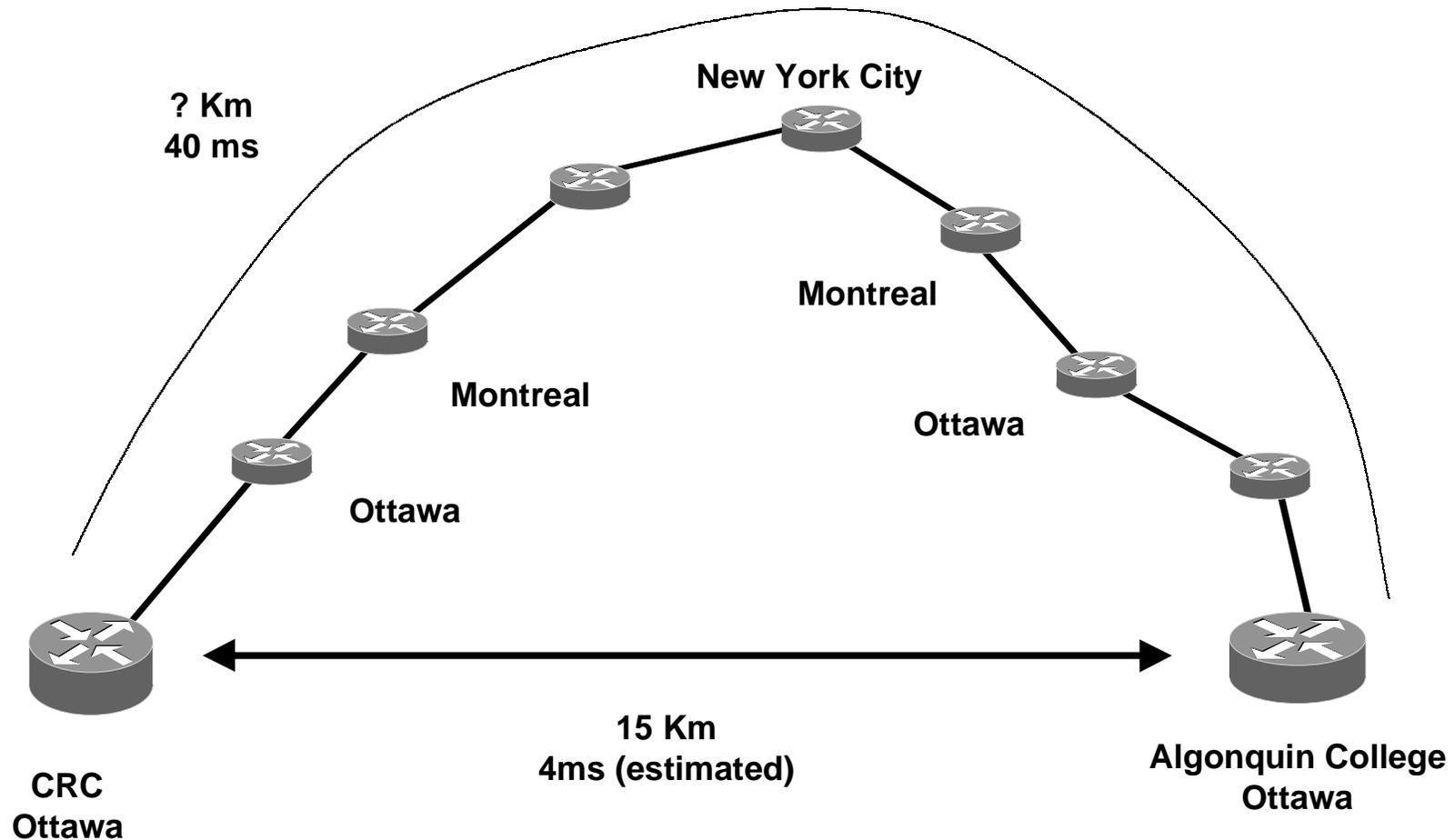
- It's usually located in a central place
- It is usually run by a neutral non-profit organization, so that no one organization can hold it hostage
- It's usually through a switch of some sort, either at layer 2 (ATM PVC's) or at layer 3 (Ethernet switch)
- You bring a line in, co-locate a router, and plug-in
 - Line could be T1, DS3, OC-3, FastEthernet, whatever
- You peer with another organization's router upon agreeing to exchange traffic via BGP4
- Policies really differ on how all of this is done

So what? Why do this?

- You have increased latency otherwise
 - more hops means running into possible congestion in the network
 - You're competing with other traffic just to get back!
- Inefficient routing
 - “While in Paris, I had to place a call through New York City to call Nice”
 - Ottawa traffic is usually back-hauled to Montreal or Toronto before exiting and coming back through another backbone
 - That adds more hops, possibly more latency, and you depend upon your upstream to provision more backbone capacity - if they can or want to.

Do you know the way to....

- Algonquin College is odd to get to...



So what continued...

- For increasing amounts of data traffic, you need to spend increasing amounts of money
 - Bad for you, good for your friendly backbone sales droid
 - I.e. you have to buy more Internet connectivity
 - \$\$\$\$
- Ottawa seems poised to start moving even more traffic around the city:
 - school-to-school
 - hospital-to-hospital
 - government-to-government

So what continued...

- Organizations like the above are looking for cost-effective ways to talk to each other, not necessarily bigger Internet pipes
- “Oh we don’t need to connect, because we have most customers coming through us, so we’re already an IX!”
 - Yes, very true. How much are you paying to connect to that “IX”?
 - In a perfect, monopolistic world, this works
 - One company, with a vested interest, sets prices

The Ottawa Internet Exchange

- OttIX for short
- A dream given form, first proposed in 1998 as OCIX on the CRC GigaPoP website
- A lone employee of IGS, a local ISP, decided to “just do it” (Hi Jake)
- Located at 151 Slater, suite 301
- The point is to keep traffic local
- Details at website: <http://www.ottix.net/>
- I have been collaborating as time permits to improve the idea and promote it

Is it worth it to Connect?

- How much of your traffic is really destined for Ottawa?
 - Is it 5%? 20%? 50%?
- Initially, for folks with low amounts of traffic destined for Ottawa, connecting is not worth it
 - But if you have customers who want to utilize applications needing low-latency, this will change
 - eg. Videoconferencing within the city
 - They'll spend more time connected to you
 - You'll get more \$\$\$ out of them (call it a premium svc)
 - The value-added pitch is up to you to make to that customer.
 - But you have to connect to OttIX

Bottom Line: What's the Cost?

- A T1 (1.5Mb/s) to OttIX costs us \$10K/year
- DSL (7Mb/s) costs around \$25 a month
- Setting up peering to OttIX members costs several keystrokes
- So dedicated bandwidth is cheap.

Conclusion

- Connecting to an IX is worth it if you want to minimize latency and get the most bang for your buck in bandwidth to the local community
- Is YOUR ISP connected to OttIX?
 - If not, tell yours and threaten that you'll switch
 - Nothing like loss of revenue via word-of-mouth as a key motivator

The Nitty-Gritty

- The rest of the presentation describes
 - OttIX internals
 - Services available at OttIX
 - Services we each have to bring to OttIX and it's members

OttIX Services

- Initially, simple, straight BGP4 peering
 - between members, no transit or upstream services
- OttIX expects an RJ45 connection
- You can co-locate a router - but within reason
 - No room for full-size PC systems running Zebra, MRT or GateD
 - UPS only for the OttIX, BOYUPS if you'd like and share
- If there's a desire, backbones are invited to co-locate or connect at OttIX and have their networks peer with us.
- OttIX does no routing per se, you do

Types of Peering

- Route server
 - Good for low-bandwidth EP's, I.e., <45Mb/s
 - You peer to the route server, everyone peers to you
 - Bad for bigger capacities, puts too much load on route server.
- Direct peering
 - Scales very well
 - Fully anarchic: you peer with whomever you like
 - Can get messy to figure out who peers to who real fast, so co-ordination becomes harder
 - StarTap recently went this way from a route server

Address Space Requirements

- We need no more than a /24
- This space should not be announced, anywhere, by anyone
- It can be directly assigned by OttIX
- Alternative is to ask EP.net to administrate instead
 - Bill Manning would assign OttIX a /24
 - This means new OttIX members must apply for an IP address via an organization outside OttIX
 - No headaches for the OttIX admins
- Or we apply through ARIN, making OttIX subject to their guidelines and policies
 - Could be costly in terms of time in justifying why

Route Administration

- Register your routes
 - A RR is a good idea
 - CRC already runs a Routing Registry and mirrors RADB
 - CRC exports it's routing policy so the Internet understand what CRC is doing.
 - Uses RPSL
- Through an RR, you can generate routing prefixes using RTConfig
 - Helps prevent “routing accidents”
- Should eventually be run by OttIX

Stone Soup IX

- CRC has an official RedHat mirror (and more)
- @Home has many Napster users
 - The Universities and ISP's are sources of consumers
- Magma hosts a CA. Domain server
- CRC has Mbone (multicast)
- Everybody's got a NNTP (USENet) server
- CRC has a route-views server
 - Get different points of view on how the Internet views your routes
 - Contributions of routing tables are appreciated
 - we will neither forward your traffic elsewhere nor route for you

Stone Soup IX cont'd

- CRC has ARIN-assigned IPv6 space
 - /40 out of /128
 - We can provide IPv6 services for those interested in getting their feet wet
- Does anyone else have carrots, peas or tomatoes to contribute?

Outstanding Issues

- Obtaining address space
- Incorporation
- Future membership fees
- Expansion requirements
 - Distributing the IX
- Transitting customers
 - We really need to co-ordinate this through a RR

References

- Exchange Points site, by Bill Manning
 - <http://www.ep.net/>
- PAIX
 - <http://www.paix.net/>
- TorIX
 - <http://www.torontointernetexchange.net/>
- LINX
 - <http://www.linx.net/>
- CRC NIC
 - <http://nic.crc.ca/>
- NANOG
 - <http://www.nanog.org/>

Internet T1 vs Dedicated T1

- Consider the following yearly cost:
 - Internet T1: \$26 500 - \$35 000
 - This is for a dedicated T1, plus Internet access (The value-added stuff - remember, you get what you pay for)
- A dedicated T1 has no value-added to it
 - No Internet access, you use it for whatever purpose you like, etc.
 - It's for point A to point B access.
- Consider the yearly cost of a plain T1:
 - T1: \$10 000 - \$12 500
- In other words, a dedicated pipe is cheaper than an Internet pipe
- Hold that thought for a moment